WHAT IS CLAIMED IS:

1. An apparatus for controlling a first bicycle transmission and a second bicycle transmission which, in combination, sets a speed stage of the bicycle, comprising:

a transmission position communication path for communicating information indicating the operational position of the first transmission and the second transmission;

a transmission command communication path for communicating information for controlling the operation of the first transmission and the second transmission;

a shift command communication path for communicating shift commands to select a speed stage of the bicycle;

a transmission control unit operatively coupled to the shift command communication path, to the transmission position communication path and to the transmission command communication path for receiving the shift commands and the information indicating the operational position of the first transmission and the second transmission and for generating the information for controlling the operation of the first transmission and the second transmission;

wherein, when the transmission control unit receives at least one shift command requesting a shift through N speed stages to a destination speed stage, where N is an integer greater than one, the transmission control unit generates information for causing the first transmission and the second transmission in combination to move a total of M times to reach the destination speed stage, where M is an integer less than N.

2. The apparatus according to claim 1 wherein the information for controlling the operation of the first transmission and the second transmission comprises a first signal for operating a front derailleur and a second signal for operating a rear derailleur.

3. The apparatus according to claim 1 wherein the transmission control unit comprises a table memory for storing a table containing the information for controlling the operation of the first transmission and the second transmission.

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4. The apparatus according to claim 3 wherein the first transmission moves to X first transmission positions, wherein the second transmission moves to Y second transmission positions, wherein X any Y both are integers greater than 1, and wherein the table memory contains information for controlling the operation of at least one of the first transmission and the second transmission for each X first transmission position and for each Y second transmission position.

5. The apparatus according to claim 4 wherein the table memory contains information for moving only one of the first transmission and the second transmission by only one of the corresponding first transmission positions and second transmission positions to reach the destination speed stage in response to a shift command requesting a shift through N speed stages to reach the destination speed stage.

6. The apparatus according to claim 4 wherein the table memory contains information for controlling the operation of at least one of the first transmission and the second transmission for shift commands requesting a shift through a single speed stage and for shift commands requesting a shift through N speed stages.

7. The apparatus according to claim 4 wherein the table memory contains information for maintaining both the first transmission and the second transmission stationary in response to a shift command requesting a shift through N speed stages to reach the destination speed stage.

8. The apparatus according to claim 1 wherein the shift command requesting a shift through N speed stages comprises a first command signal and a second command signal, wherein the first command signal and the second command signal occur simultaneously.

9. The apparatus according to claim 8 wherein the first command signal occurs prior to the second command signal.

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10. The apparatus according to claim 1 wherein the shift command requesting a shift through N speed stages comprises a first command signal and a second command signal, wherein the first command signal and the second command signal occur within a prescribed time interval.

11. The apparatus according to claim 10 wherein the occurrences of the first command signal and the second command signal are not simultaneous.

12. The apparatus according to claim 1 wherein the shift command requesting a shift through N speed stages comprises a command signal that occurs for a time interval greater than a prescribed value.

13. The apparatus according to claim 1 further comprising a manually-operated shift control unit operatively coupled to the shift command communication path.

14. The apparatus according to claim 1 further comprising:

a speed sensor operatively coupled to a speed communication path; and

an automatic shift control unit operatively coupled to the speed communication path and to the shift command communication path for automatically generating shift commands based on information received from the speed sensor.

15. The apparatus according to claim 14 wherein the automatic shift control unit generates shift commands based on bicycle speed.

16. The apparatus according to claim 14 wherein the automatic shift control unit generates shift commands based on bicycle acceleration.

17. The apparatus according to claim 1 further comprising:

a cadence sensor operatively coupled to a cadence communication path; and

an automatic shift control unit operatively coupled to the cadence communication path and to the shift command communication path for automatically generating shift commands

based on information received from the cadence sensor.

18. The apparatus according to claim 1 further comprising:

a manually-operated shift control unit operatively coupled to the shift command communication path;

a speed sensor operatively coupled to a speed communication path; and

an automatic shift control unit operatively coupled to the speed communication path and to the shift command communication path for automatically generating shift commands based on information received from the speed sensor.

19. The apparatus according to claim 1 further comprising:

a manually-operated shift control unit operatively coupled to the shift command communication path;

a cadence sensor operatively coupled to a cadence communication path; and

an automatic shift control unit operatively coupled to the cadence communication path and to the shift command communication path for automatically generating shift commands based on information received from the cadence sensor.

20. A bicycle transmission comprising:

a plurality of front sprockets;

a front derailleur for moving a chain among the plurality of front sprockets;

a front derailleur motor for moving the front derailleur;

a plurality of rear sprockets;

a rear derailleur for moving the chain among the plurality of rear sprockets;

a rear derailleur motor for moving the rear derailleur;

a front derailleur position sensor for providing a signal indicating a front sprocket position of the front derailleur;

a rear derailleur position sensor for providing a signal indicating a rear sprocket position of the rear derailleur;

wherein the front sprocket position of the front derailleur and the rear sprocket position of the rear derailleur set a speed stage of the bicycle transmission;

a transmission position communication path operatively coupled to the front derailleur position sensor and to the rear derailleur position sensor for communicating the signals indicating the front sprocket position and the rear sprocket position;

a transmission command communication path operatively coupled to the front derailleur motor and to the rear derailleur motor for communicating information for controlling the operation of the front derailleur motor and the rear derailleur motor;

a shift command communication path for receiving shift commands to set a desired speed stage;

a transmission control unit operatively coupled to the shift command communication path, to the transmission position communication path and to the transmission command communication path for receiving the shift commands and the signals indicating the front sprocket position and the rear sprocket position and for generating the information for controlling the operation of the front derailleur motor and the rear derailleur motor;

wherein, when the transmission control unit receives at least one shift command requesting a shift through N speed stages to a destination speed stage, where N is an integer greater than one, the transmission control unit generates information for causing the front derailleur and the rear derailleur in combination to move a total of M sprocket positions to reach the destination speed stage, where M is an integer less than N.

21. The transmission according to claim 20 wherein a change of gear ratio when the front derailleur moves from a first front sprocket to a second front sprocket is approximately equal to twice a change of gear ratio when the rear derailleur moves from a first rear sprocket to a second rear sprocket.

22. A method for controlling a first bicycle transmission and a second bicycle transmission which, in combination, sets a speed stage of the bicycle, comprising the steps of:

receiving, by a transmission control unit, information indicating the operational position of the first transmission and the second transmission;

receiving, by the transmission control unit, at least one shift command requesting a shift through N speed stages to a destination speed stage, wherein N is an integer greater than one; and

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generating, by the transmission control unit, information for causing the first transmission and the second transmission in combination to move a total of M times to reach the destination speed stage, wherein M is an integer less than N.

23. The method according to claim 22 wherein the information for controlling the operation of the first transmission and the second transmission comprises a first signal for operating a front derailleur and a second signal for operating a rear derailleur.

24. The method according to claim 22 further comprising the step of storing a table containing the information for controlling the operation of the first transmission and the second transmission.

25. The method according to claim 24 wherein the first transmission moves to X first transmission positions, wherein the second transmission moves to Y second transmission positions, wherein X any Y both are integers greater than 1, and wherein the storing step comprises the step of storing information for controlling the operation of at least one of the first transmission and the second transmission for each X first transmission position and for each Y second transmission position.

26. The method according to claim 25 wherein the storing step further comprises the step of storing information for moving only one of the first transmission and the second transmission by only one of the corresponding first transmission positions and second transmission positions to reach the destination speed stage in response to a shift command requesting a shift through N speed stages to reach the destination speed stage.

27. The method according to claim 25 wherein the storing step further comprises the step of storing information for controlling the operation of at least one of the first transmission and the second transmission for shift commands requesting a shift through a single speed stage and for shift commands requesting a shift through N speed stages.

28. The method according to claim 25 wherein the storing step further comprises the step of storing information for maintaining both the first transmission and the second transmission stationary in response to a shift command requesting a shift through N speed stages to reach the destination speed stage.

29. The method according to claim 22 wherein the shift command requesting a shift through N speed stages comprises a first command signal and a second command signal, wherein the first command signal and the second command signal occur simultaneously.

30. The method according to claim 29 wherein the first command signal occurs prior to the second command signal.

31. The method according to claim 22 wherein the shift command requesting a shift through N speed stages comprises a first command signal and a second command signal, wherein the first command signal and the second command signal occur within a prescribed time interval.

32. The method according to claim 31 wherein the occurrences of the first command signal and the second command signal are not simultaneous.

33. The method according to claim 22 wherein the shift command requesting a shift through N speed stages comprises a command signal that occurs for a time interval greater than a prescribed value.

34. The method according to claim 22 further comprising the step of manually generating the at least one shift command.

35. The method according to claim 22 further comprising the steps of:

receiving, by an automatic shift command unit, information from a speed sensor; and

automatically generating shift commands based on information received from the speed sensor.

36. The method according to claim 35 wherein the step of automatically generating shift commands comprises the step of generating shift commands based on bicycle speed.

37. The method according to claim 35 wherein the step of automatically generating shift commands comprises the step of generating shift commands based on bicycle acceleration.

38. The method according to claim 22 further comprising the steps of:

receiving, by an automatic shift command unit, information from a cadence sensor; and

automatically generating shift commands based on information received from the cadence sensor.